


Declass Review by NIMA/DOD

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 No. 7506

DIRECT IMAGE VIEWER

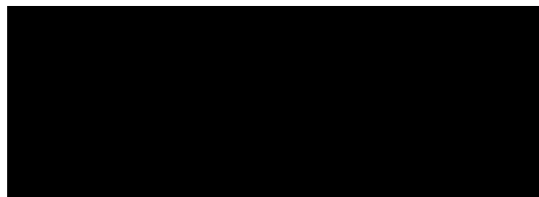
Third Quarterly Report

1/13/65 - 4/13/65

Project 7506


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I. PROGRESS SUMMARY

- A. The viewer is complete except for painting and installation of the optics.
- B. The two objective lenses and 5X mirrors have been installed and aligned.

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- C. A meeting was held on 29 January at [REDACTED] to review the results of the first trial grating. Copies of the final report were sent to the customer.

- D. Some schedule delay has been encountered due to late delivery of the optical components from [REDACTED]

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- E. The second ^{trial grating} ~~try~~ will be completed by 7 May. Dr. [REDACTED] will visit [REDACTED] with the results in May.

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II. ADMINISTRATION DETAILS

A. Schedule

The second quarterly report indicated a delivery schedule of the first week in May. This has been changed to mid-May due

STATOTHRto late delivery of the optics from [REDACTED] STATOTHR

[REDACTED] now plans to deliver the optics on 3 May.

The acceptance test with the customer is now planned for the week of 17 May.

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B. Review of Efforts by [REDACTED]

Copies of the report on the first trial of Phase II were sent to the customer. Both customer representatives and [REDACTED] STATOTHR
STATOTHR [REDACTED] project engineer were present at the review of the results.

STATOTHR During the acceptance test period in May, [REDACTED] STATOTHR
personnel will bring to [REDACTED] the results of Trial 2, Phase II. It is expected that the success of this trial will greatly influence the future efforts of [REDACTED]

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III. TECHNICAL DISCUSSION

A. Progress

1. Optics

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Four optical elements were delivered to [REDACTED] and have been installed. These were the two objective lenses and mirrors used for the 5X magnification. The two lenses used are: for 50X magnification, a Bell and Howell Angenieux f/0.9 50mm lens, and for 5X magnification a Schneider Componon 210mm lens. Both were modified to contain square apertures with an apparent side dimension of 0.707 which is adjustable by $\pm 10\%$.

The 1-inch lens resolves in excess of 700 l/mm with a high contrast target. With this quality the viewer resolution will be limited only by the observer. The resolution of the 5X lens exceeds that required to surpass that of the operator.

These lenses have been mounted on the viewer along with the mirrors and focusing and alignment tests made.

2. Diffraction Grating

Trial 1 was completed and trial 2 will be completed in early May. The results of trial 1 were passed on to the customer early this quarter. These results may be summarized as follows:

- a) The measured results did not agree with the calculated values.
- b) The intensity variation was greater than required.
- c) The variation in intensity from order to order was reduced by using a broader band light source.

- d) The large variation (22:1 with crossed gratings and 50 mμ bandwidth) visually did not appear too distracting.

These results led to the conclusion that for the second try a different approach would be tried. Larger grooves would be used to produce overlapping orders in hopes of averaging out the differences. Reports to date from [REDACTED] indicate good progress along these lines. STATOTHR

3. Viewer

The electrical-mechanical assembly and checkout is complete. The electrical drives for X-Y and magnification translation work very well. The viewer requires about five seconds to change from one magnification to another. Tests have been run on the repeatability of the magnification changing system. That is, that an object centered at one magnification appears in the center when the magnification is changed. This repeats to within .030 of an inch.

All parts inside the viewer have been black anodized except for various steel shafts, etc.

The cover has been fabricated and will be painted before the end of the month. The colors selected are light brown (tan) for the cover and dark charcoal brown for the casting.

B. Trips

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One trip was made to [REDACTED] for the review of Trial 1, Phase II on January 29, 1965.

C. Work Planned for Next Period

The viewer will be completed and delivered to the customer. The final acceptance test is planned for the week of 17 May. A final Engineering Report will be submitted following the delivery of the viewer.

It is also anticipated that discussions will be held late in the quarter to discuss the viewer configuration for the second set of optics.